

# OSM Carto as vector tiles



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# Vector tiles

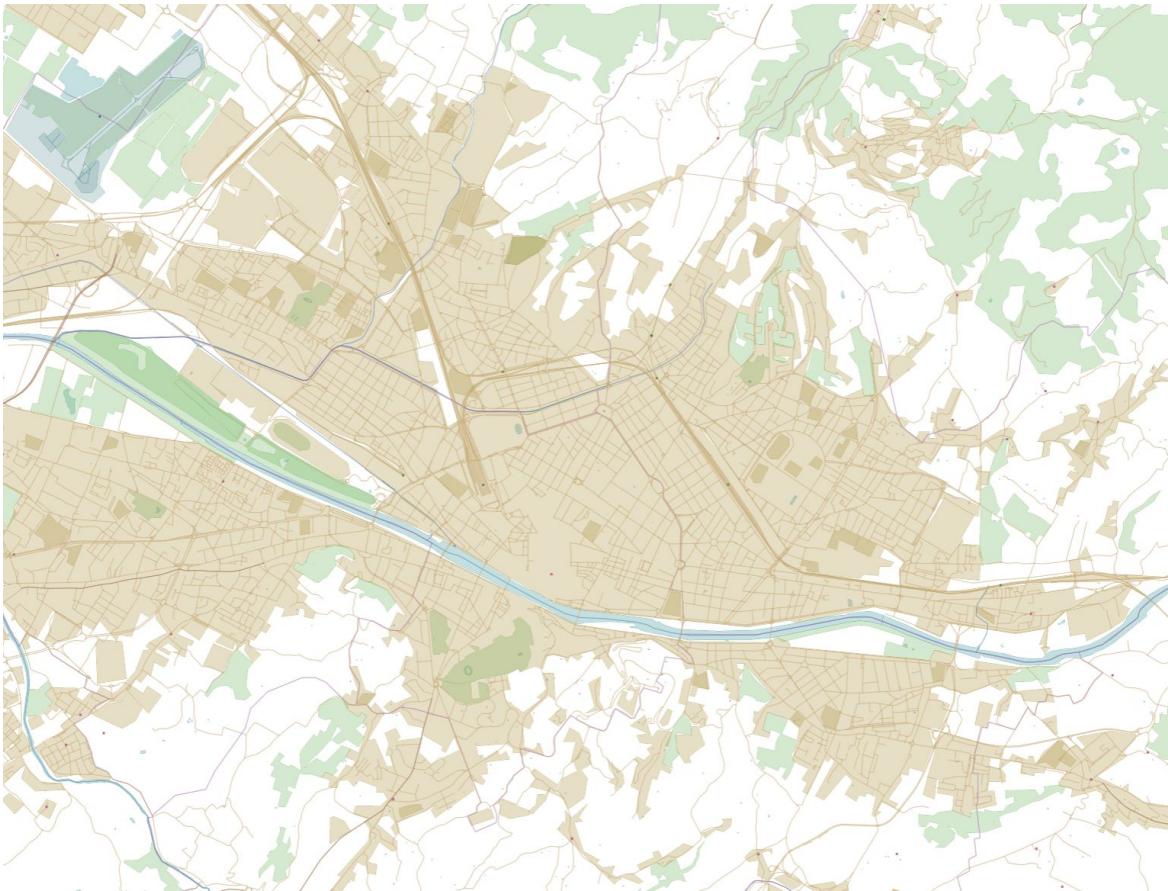
- Pyramid and zoom levels
- Individual tiles are available on Z/X/Y address
- Maps are available in Pseudo-Mercator projection (EPSG:3857)



<https://www.maptiler.com/news/2019/02/what-are-vector-tiles-and-why-you-should-care/>

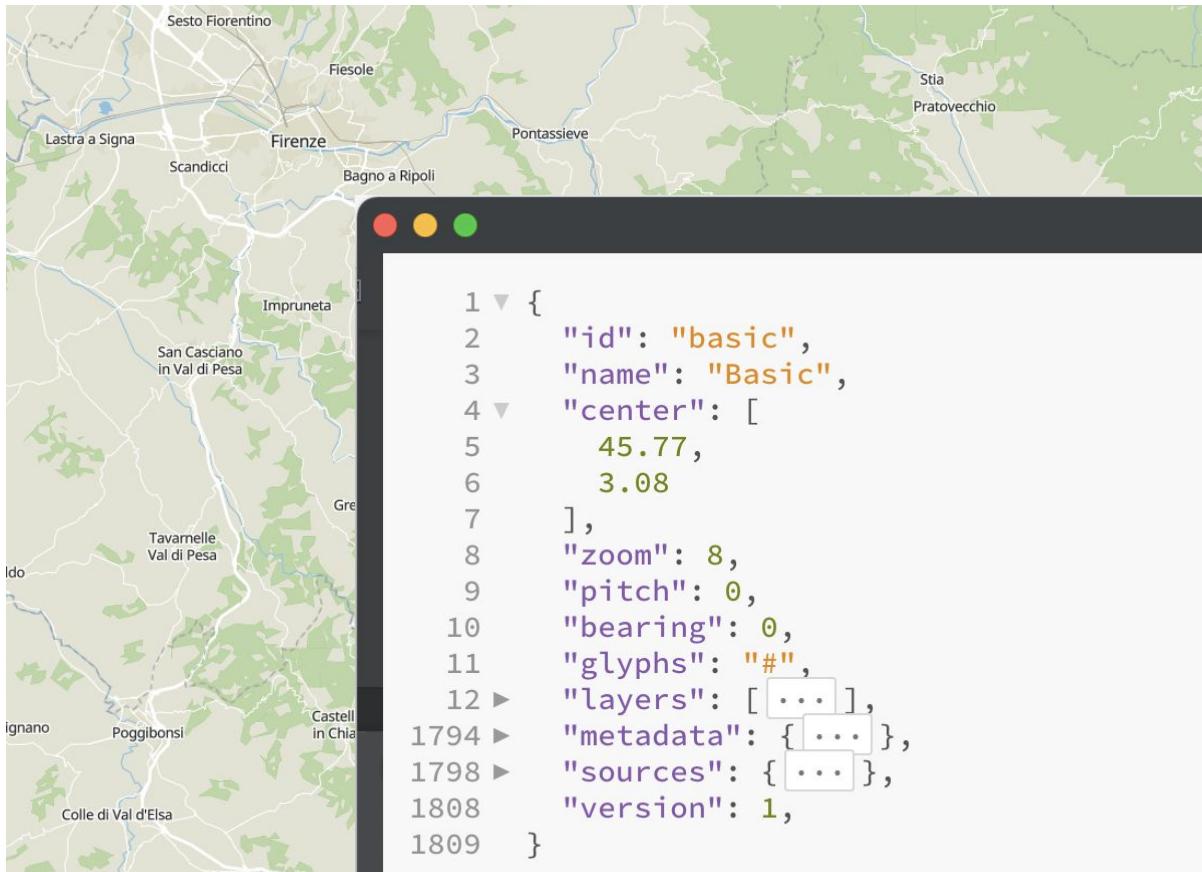
# Vector tiles

- Protocolbuffer Binary Format (pbf)
- Map size
  - [World](#): 93 GB
  - [Italy](#): 2.6 GB
  - [Firenze](#): 40 MB
- Map style is rendered on client side



# Style for vector tiles

- The look of the map is defined in **style.json** file that is rendered on the client side. (GL Style Specification)
- The style.json file contains
  - *layers*
  - *sources*
  - *glyphs*
  - *sprite*
  - *metadata*
  - ...



# Style editor

Create infinite number of styles with the same data!



<https://cloud.maptiler.com/maps/>

**Basic**

Groups

- Landscape
- Water
- Nature
- Roads
- Borders

Global settings

Language: Style default

Preferred country borders: Default

Water

Color

H: 205 S: 56% L: 73% A: 1

RESET

Force selected color

# Languages

- Labels can be dynamically changed
- More than 70 languages supported in OpenMapTiles

Groups

- Landscape
- Water
- Nature
- Roads
- Borders

Global settings

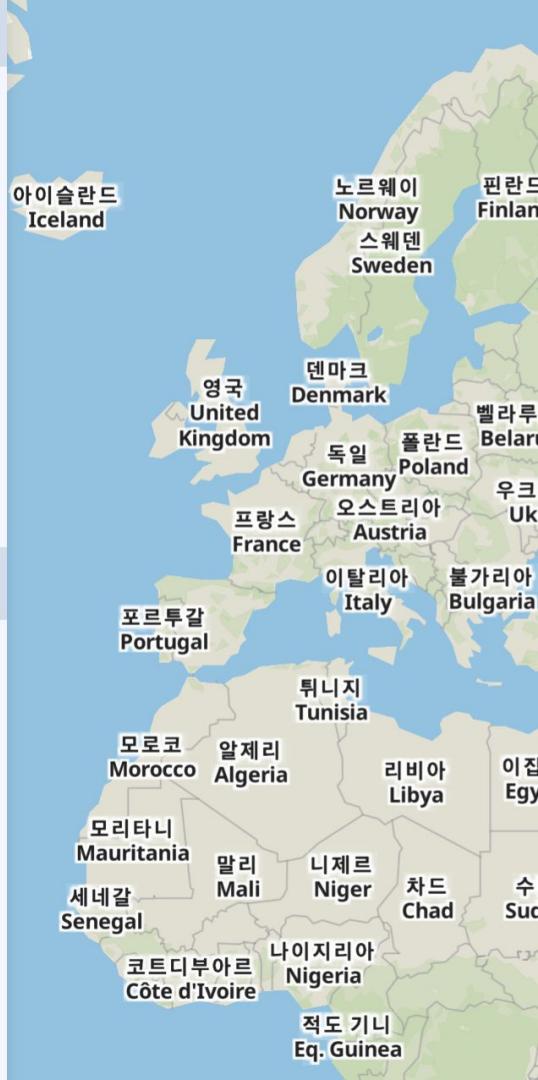
Language

Korean

Include alternative names

Preferred country borders

Default





# Disputed borders

Black Sea Biosphere Reserve  
Чорноморський біосферний заповідник

sfernij zapovidnik  
"iš-Nova" Біосферний заповідник Асканія-Нова"

Chornomorske  
Черноморское

Yevpatoriya  
Евпатория

Sevastopol  
Севастополь

Kacha  
Кача

Bakhchysarai  
Бахчисарай

Alushta  
Алушта

Yalta  
Ялта

Oktiabrskoe  
Октябрьское

Gvardeiskoe  
Гвардейское

Simferopol  
Симферополь

Rozdol'noe  
Раздольное

Dzhankoy  
Джанкой

Krasnoperekopsk  
Красноперекопск

Henichesk  
Геническ

Shchyolkino  
Шёлкино

Lenino  
Ленино

Kerch  
Керчь

Feodosia  
Феодосия

```
"filter": [
    "all",
    [ "==", "admin_level", 2 ],
    [ "==", "disputed", 1 ],
    [ "==", "maritime", 1 ]
]
```

# OpenMapTiles

- **Cartographic schema** for vector tiles
- Community-driven **open-source project**
- Applicable to any data source
  - OpenStreetMap
  - Wikidata
  - Natural Earth
- OpenMapTiles v3.13 (05-01-2022)
  - Tomas Pohanka and other contributors
- OpenMapTiles v3.14 (this fall)

<https://openmaptiles.org/>

<https://github.com/openmaptiles>

OpenStreetMap Carto style

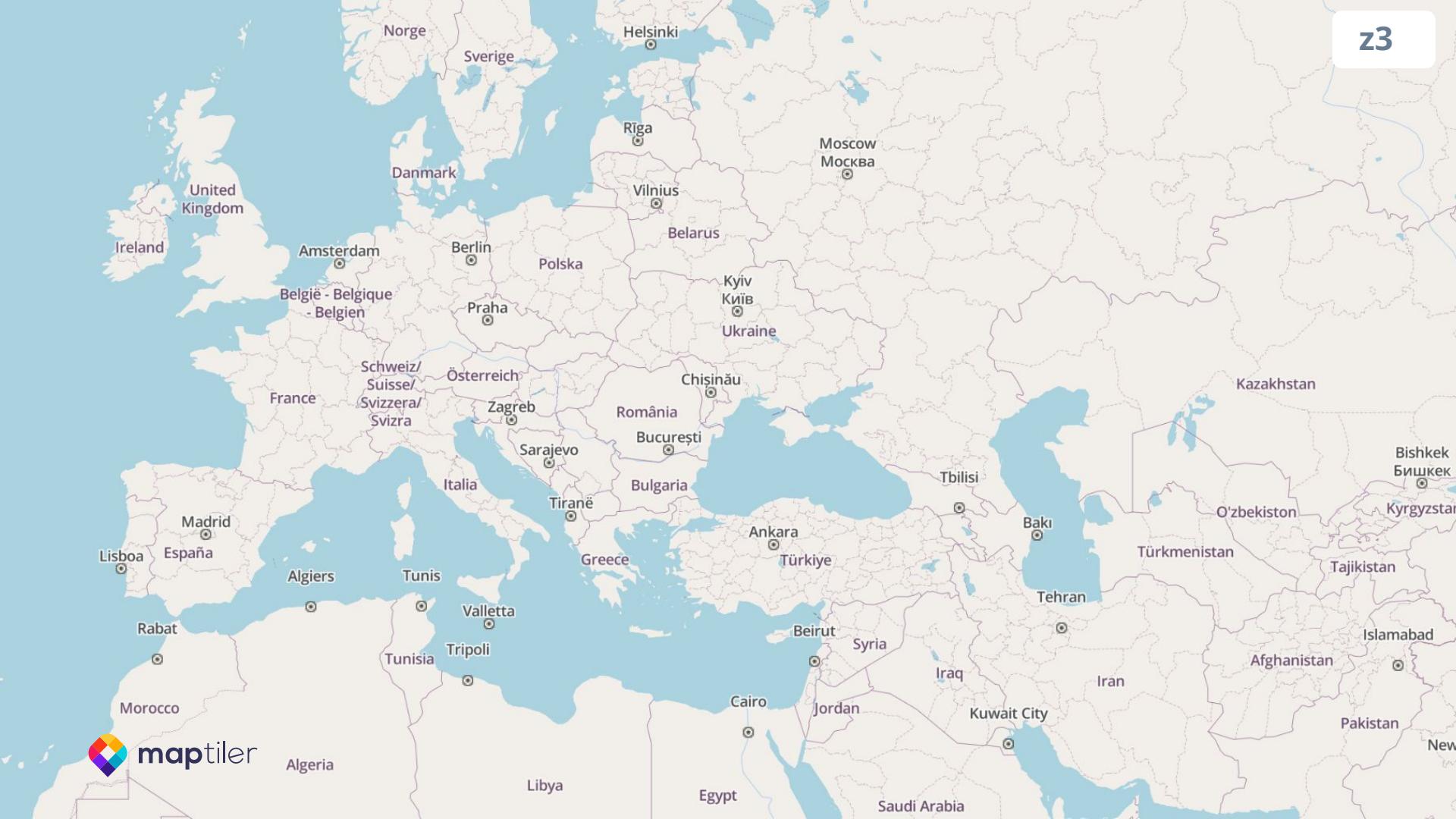


MapTiler Cloud

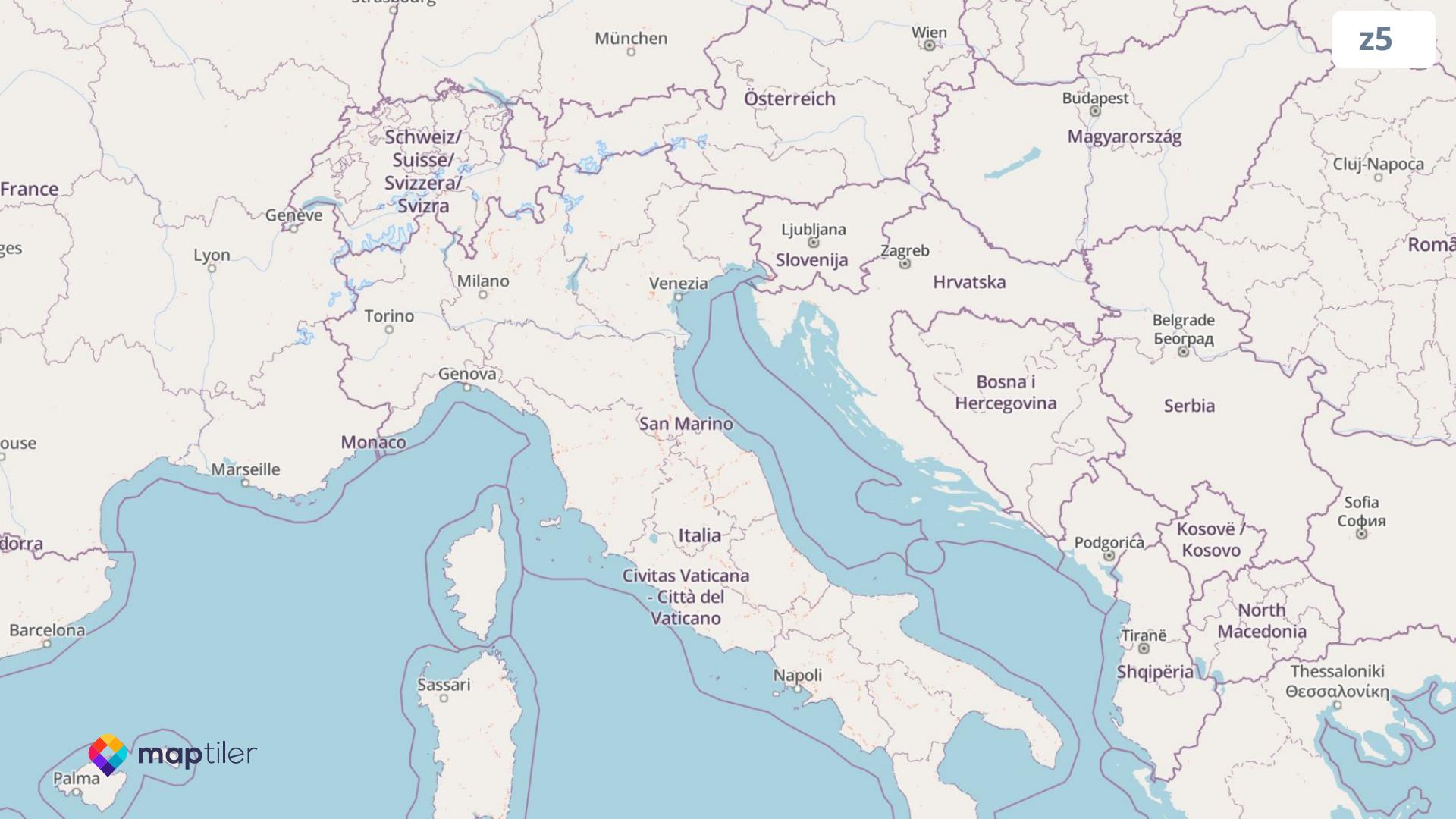
API for developers

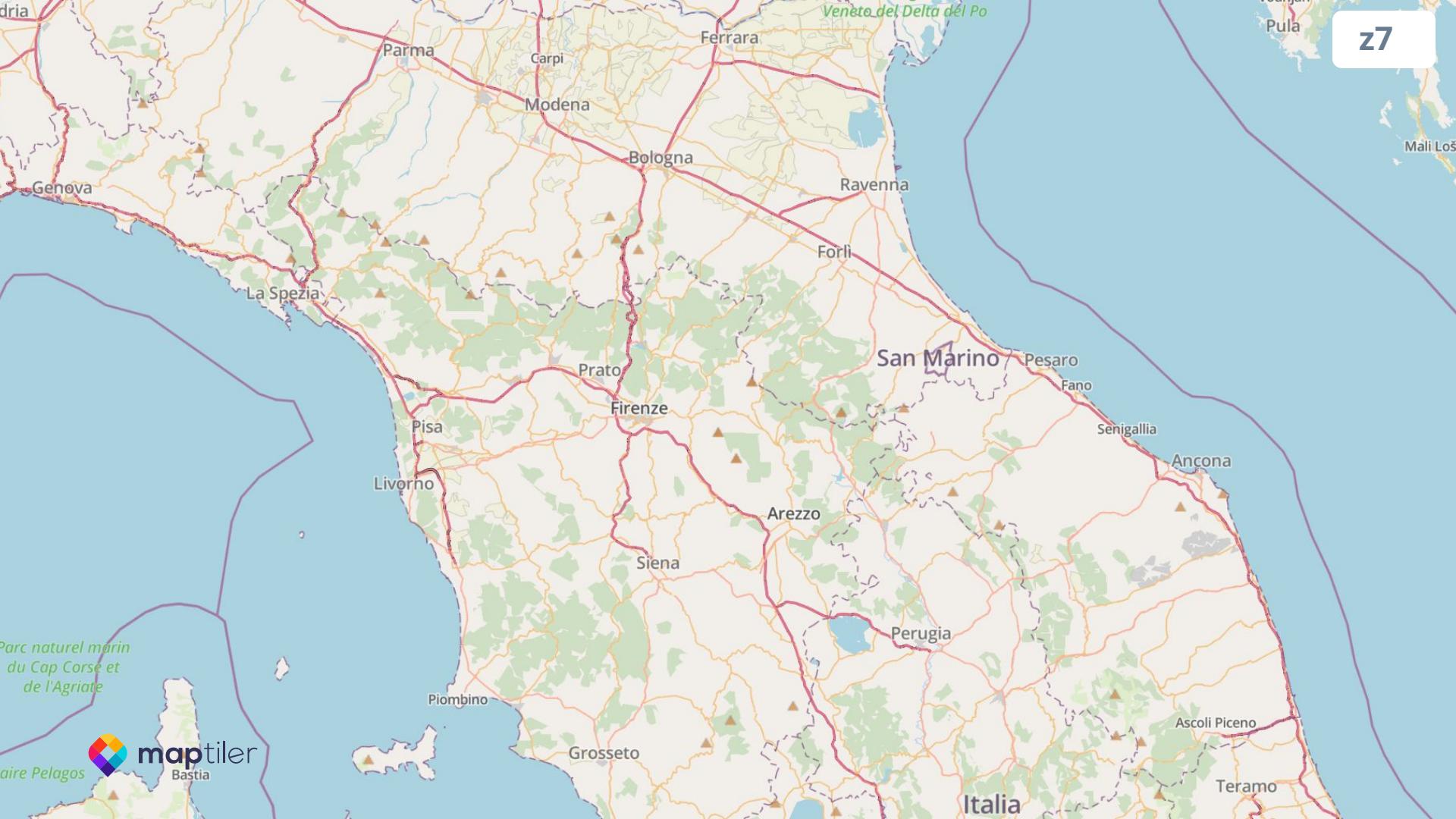
[mptiler.com/maps/openstreetmap/](https://mptiler.com/maps/openstreetmap/)

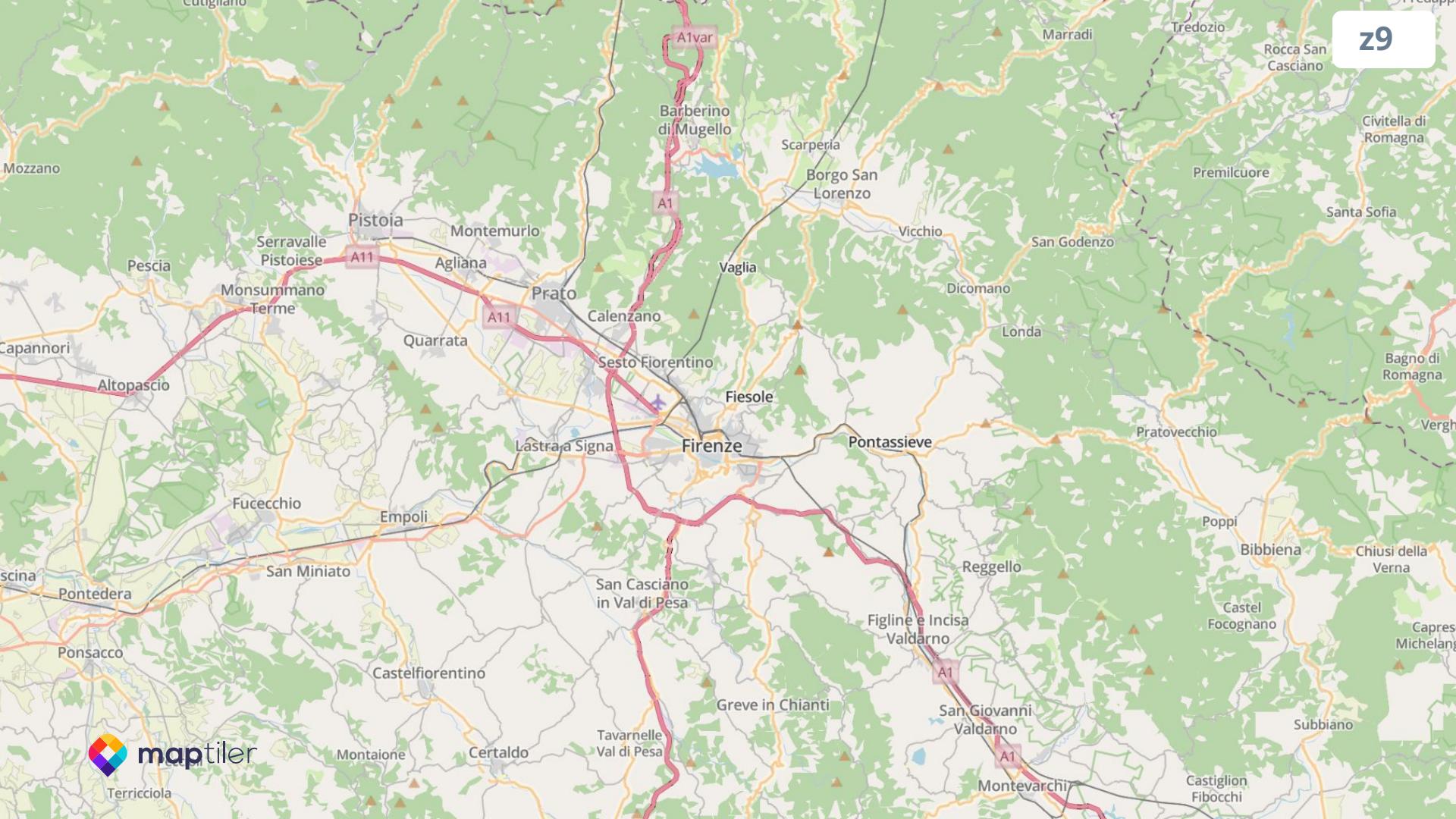
z3

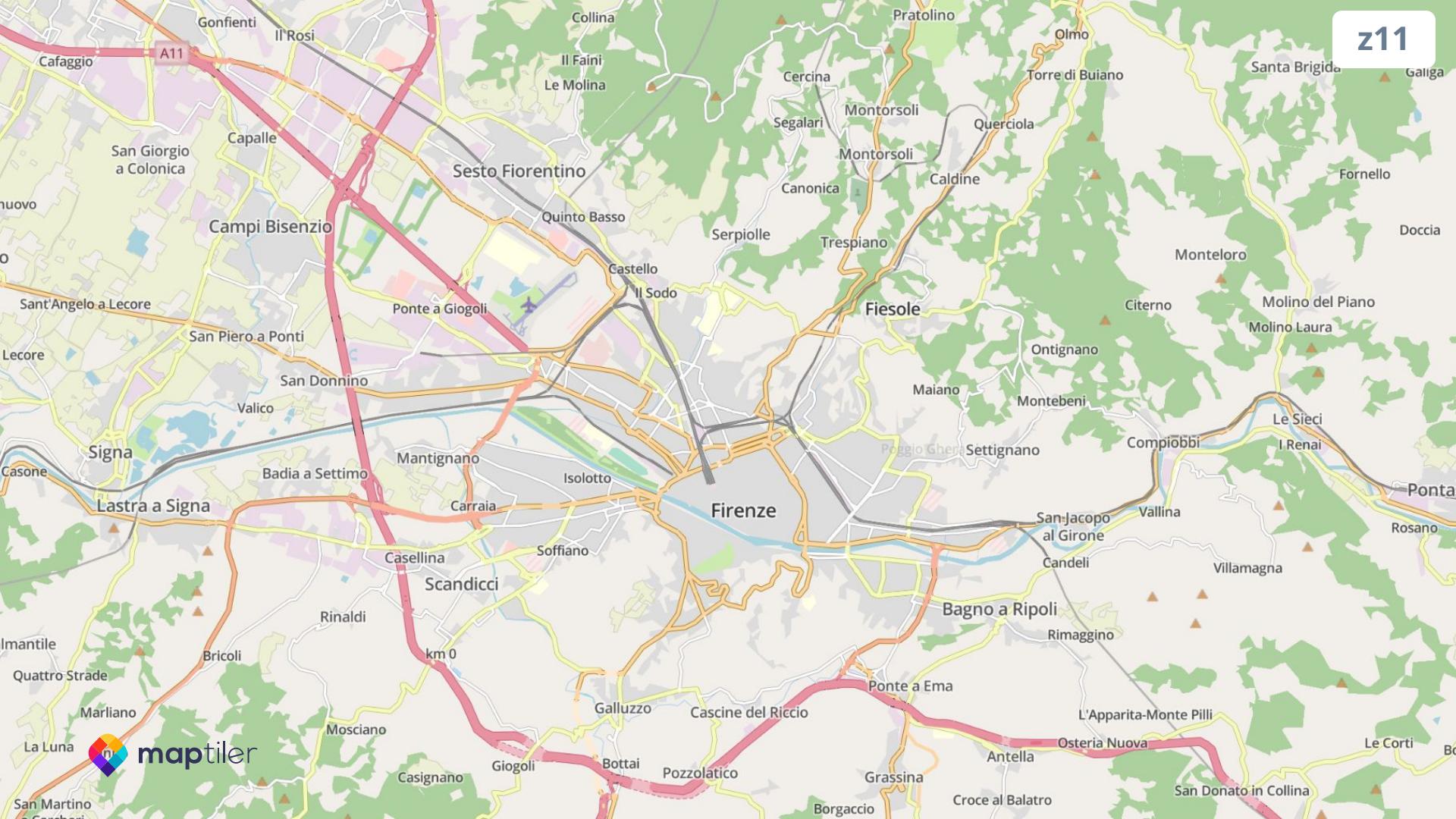


z5

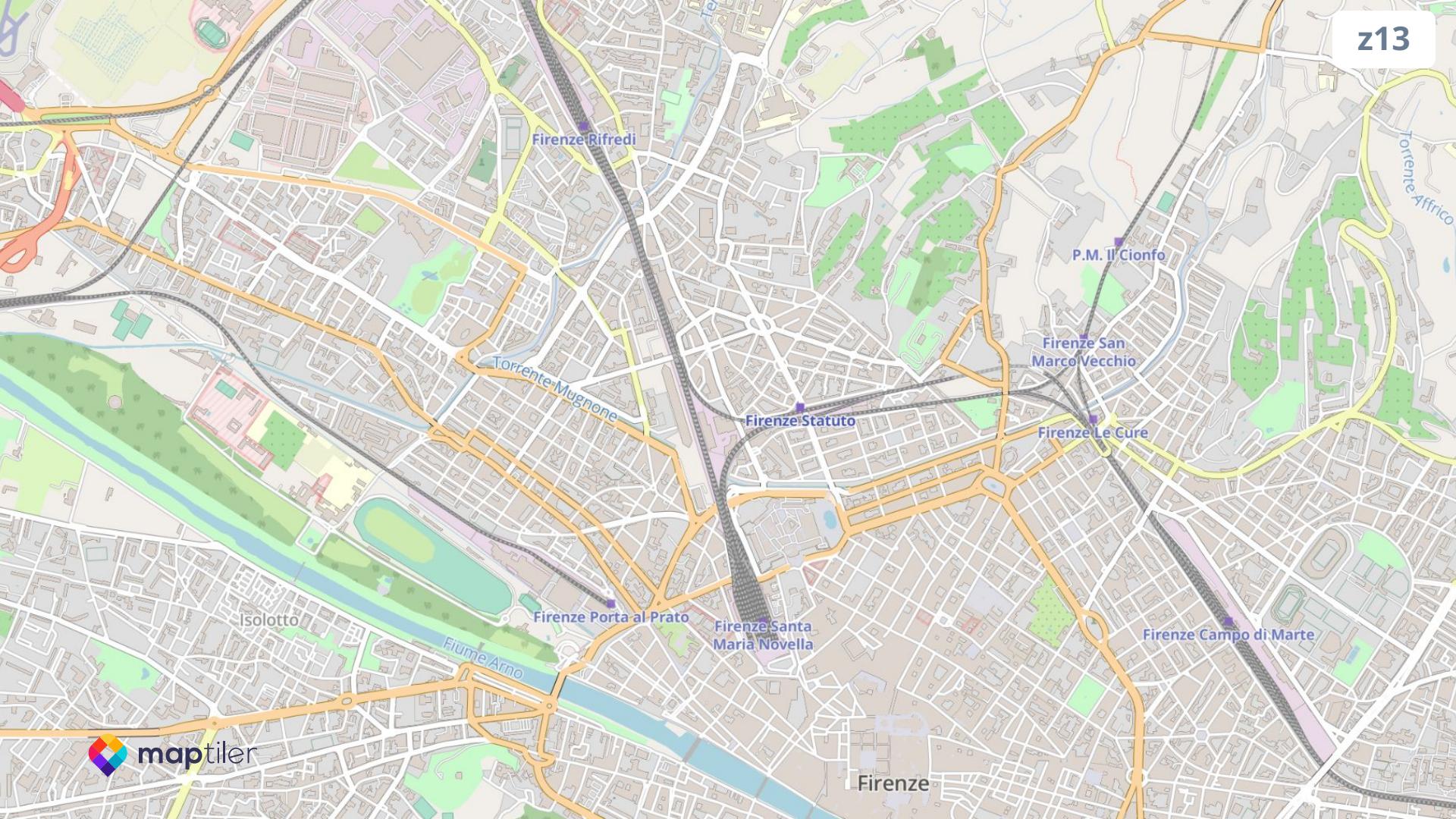


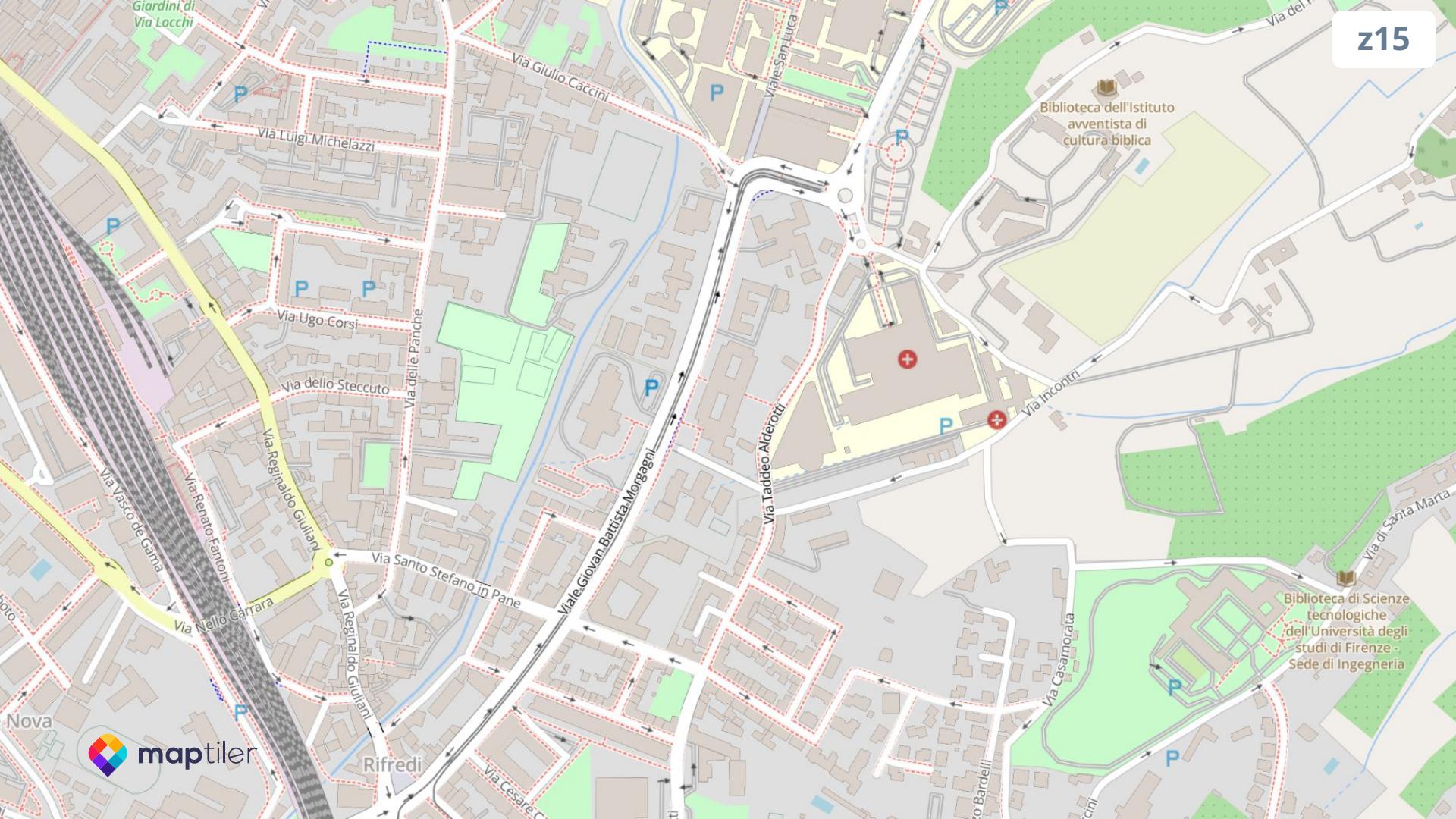


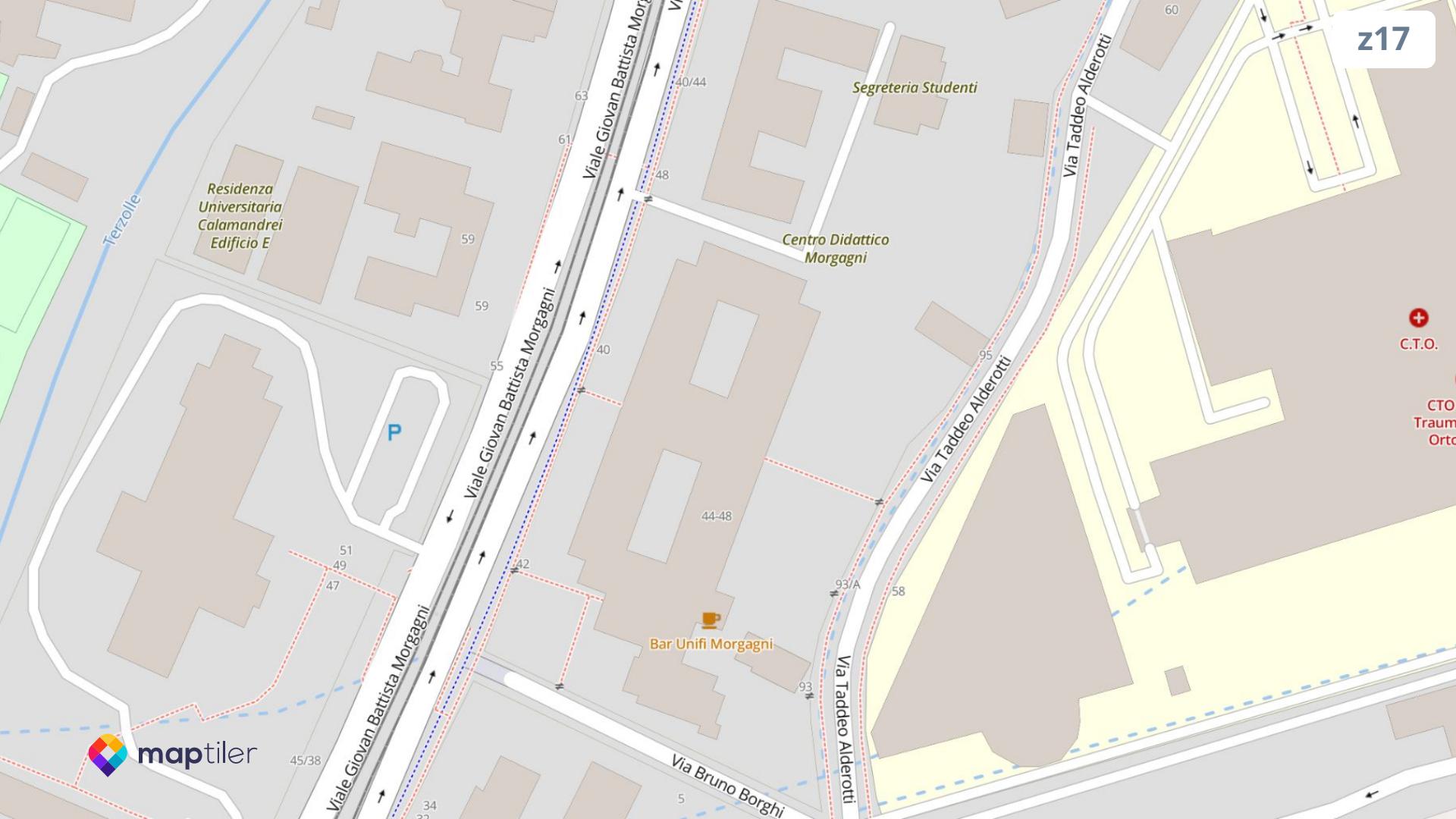




**z13**







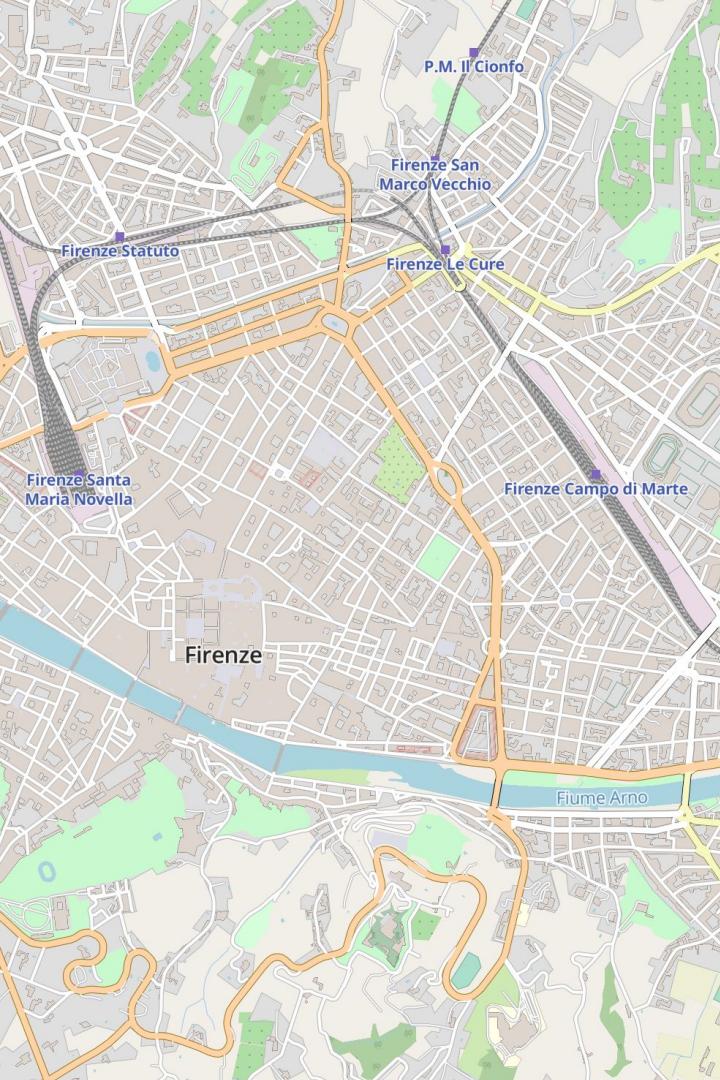
# Preparation

Adaptation of [OSM Carto](#) style to the  
[OpenMapTiles schema](#)

Collection of map properties  
(colors, textures, sizes, icons)

Preparing cartography on MapTiler Cloud

Collaborative work on Github in thematic branches



# Colors (fill-color line-color icon-color)

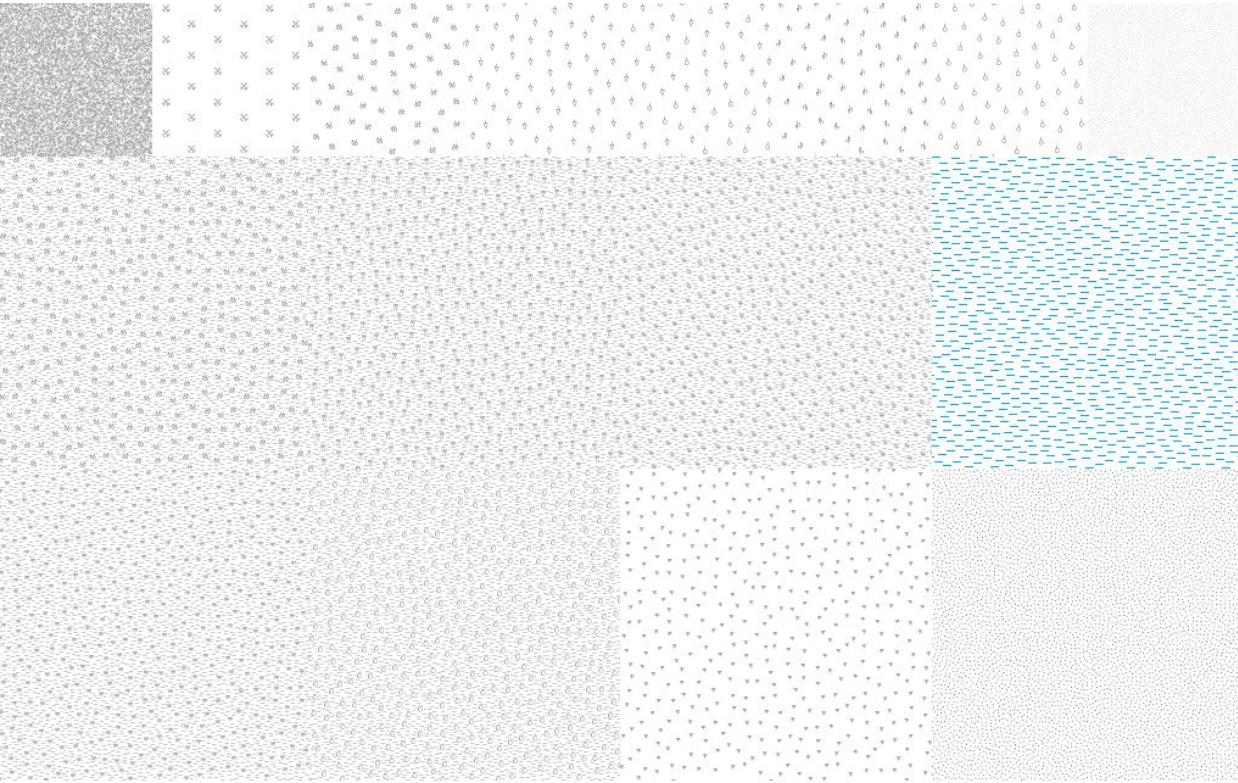


# Landcover



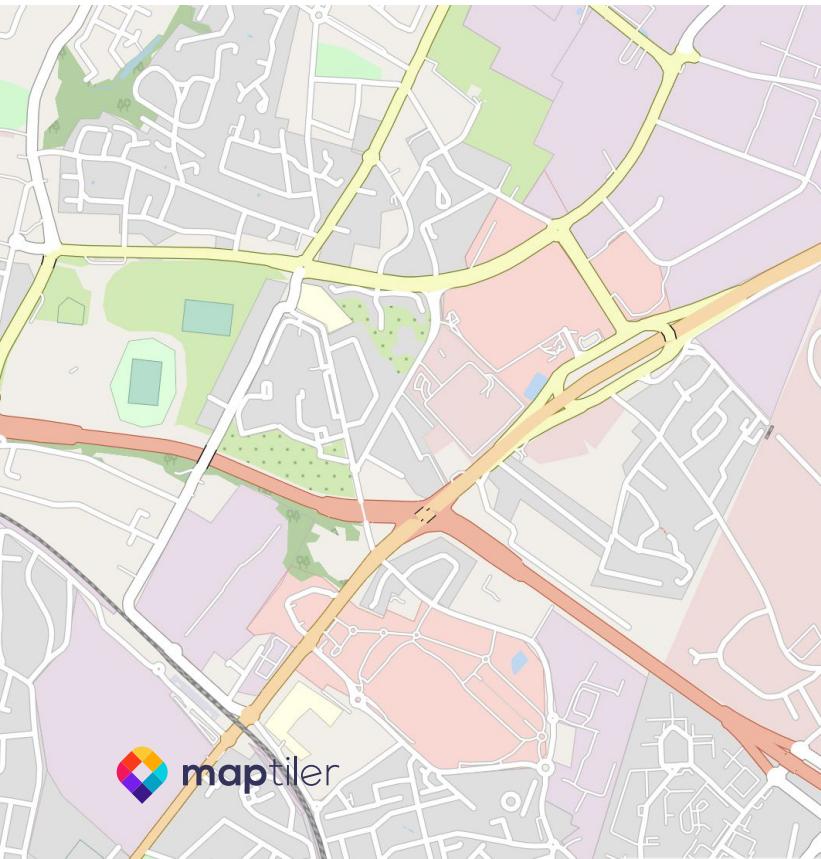
```
[  
  "match",  
  ["get", "class"],  
  "farmland",  
  "#eef0d5",  
  "wood",  
  "#add19e",  
  "rock",  
  "#eee5dc",  
  "grass",  
  "#cdebb0",  
  "sand",  
  "#f5e9c6",  
  "wetland",  
  "#add19e",  
  "#000"  
]  
  
[  
  "match",  
  ["get", "subclass"],  
  "allotments",  
  "#c9e1bf",  
  "bare_rock",  
  "#eee5dc",  
  "beach",  
  "#ffff1ba",  
  ...  
  ...  
  ...  
  "vineyard",  
  "#aedfa3",  
  "wet_meadow",  
  "#cdebb0",  
  "#ffffff"  
]
```

# Textures (fill-pattern)



```
[  
  "match",  
  ["get", "subclass"],  
  "allotments",  
  "bare_rock",  
  "rock_overlay",  
  "beach",  
  "bog",  
  "wetland_bog",  
  "scrub",  
  "forest",  
  "leaftype_unknown",  
  "garden",  
  "plant_nursery",  
  "mangrove",  
  "wetland_mangrove",  
  "marsh",  
  "wetland_marsh",  
  "orchard",  
  "plant_nursery",  
  "reedbed",  
  "wetland_reed",  
  ...
```

# Landuse



```
[  
  "match",  
  ["get", "class"],  
  "railway",  
  "#ebdbe8",  
  "residential",  
  "#e0dfdf",  
  "cemetery",  
  "#aacbaf",  
  "military",  
  "#fceaea",  
  "commercial",  
  "#f2dad9",  
  "industrial",  
  "#ebdbe8",  
  "garages",  
  "#dfddce",  
  "retail",  
  ...  
]  
[  
  "match",  
  ["get", "class"],  
  "military",  
  "military_red_hatch",  
  "cemetery",  
  "grave_yard_generic",  
  ""  
]
```

# Icons (icon-image)

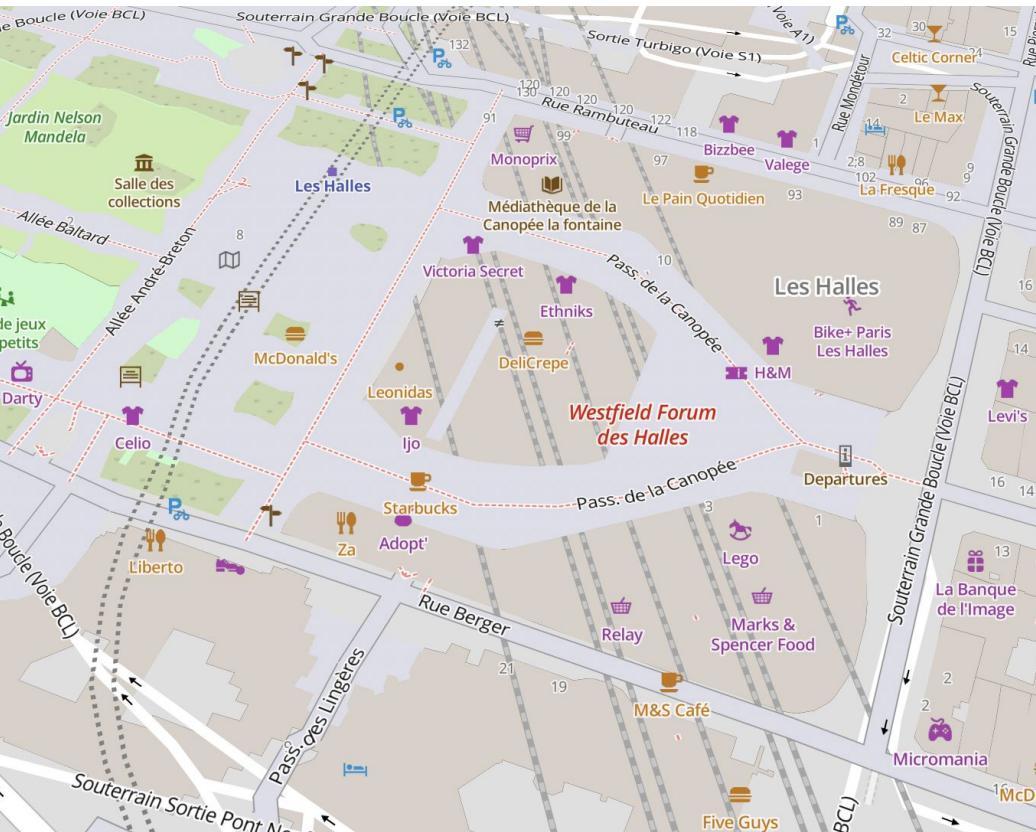


"icon-image": "{ subclass }"

305 SVG icons

## 1 image sprite

# Labels (text-font)



```
"layout": {
    "text-font": [
        "Open Sans Semibold",
        "Open Sans Regular"
    ],
    "text-size": {
        "base": 1.2,
        "stops": [
            [11, 10],
            [14, 14],
            [18, 16]
        ]
    },
    "text-field": "{name:latin}\n{name:nonlatin}",
    "visibility": "visible",
    "symbol-spacing": 150,
    "text-max-width": 10,
    "text-transform": "none"
}
```

# Map usage

- Vector tiles (style.json)
- Raster tiles (xyz)
- WMTS service
- Static maps API (PNG)



A screenshot of the maptiler CLOUD web interface. The top navigation bar is blue with the maptiler logo and the word "CLOUD". On the left, there is a sidebar with icons and text for "Maps", "Tiles", "Data", "Geocoding", and "Account". The main content area shows a world map with political boundaries and place names, labeled "Maps / OpenStreetMap". The maptiler logo is visible in the bottom right corner of the map area.

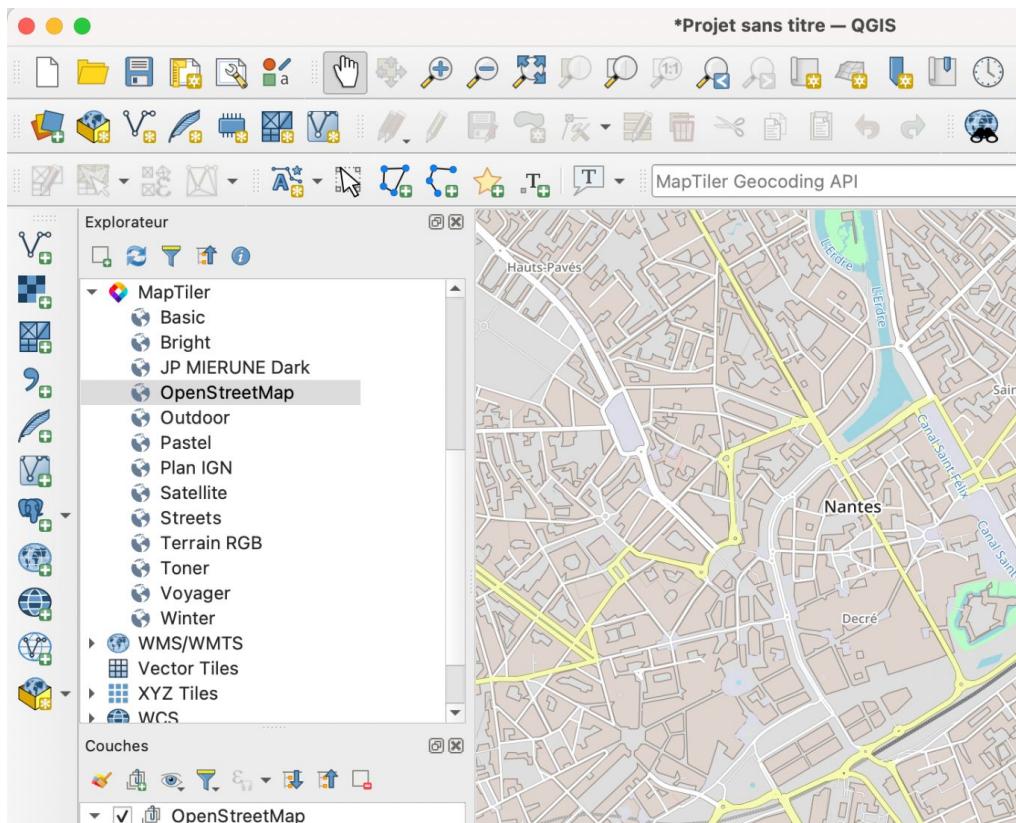
# 3D map via MapLibre!



# Vector tiles in QGIS

<https://github.com/maptiler/qgis-maptiler-plugin>

- MapTiler plugin for QGIS
- Change symbology
- Use the map as a basemap for your project in QGIS
- Print OpenStreetMap in high resolution!



# Open-source



**MapLibre**  
<https://maplibre.org/>



**OpenMapTiles**  
<https://openmaptiles.org/>



**QGIS** (tuiles vectorielles)  
<https://github.com/maptiler/qgis-maptiler-plugin>



# OpenMapTiles vector tiles on OpenStreetMap.org?

- Ongoing discussion with the OpenStreetMap Foundation
- OpenMapTiles schema for maps on openstreetmap.org
- Carto style as open-source



# Thanks!



maptiler

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